Jammed elastic shells - a 3D experimental soft frictionless granular system†

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1 Supporting Information

Atomic force microscopy (*AFM*) The thickness of the shell was measured using Atomic Force Microscopy (*AFM*, Digital Instrument, Nanoscope) in tapping mode. Samples for *AFM* were prepared by applying a drop of o suspension of the shells in ethanol (after removing the *PDMS* core) onto a glass cover slide. The collapse of the shells, due to drying, leads to plateaus in the height profile that correspond to twice the thickness of the shell.

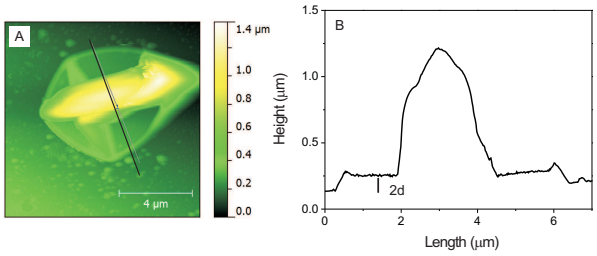

Fig. S1 (A) *AFM* image of a dried shell, after removing the *PDMS* core by washing with ethanol. (B) The height profile taken along the line drawn through the collapsed capsules shows plateaus from which we obtained a shell thickness of d = 56 nm.

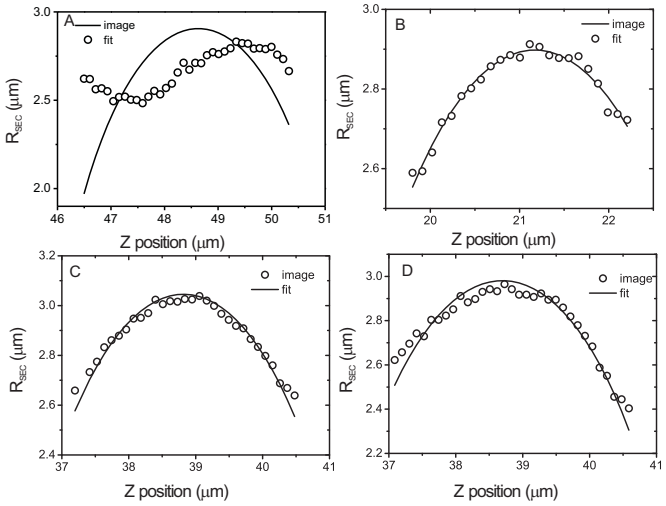

Fig. S2 Plots of radius of smallest enclosing circle R_{SEC} as a function of position along Z for (A) a typical ambiguous particle and particles containing (B) 2, (C) 6 and (D) 10 dimples. Except for the ambiguous particle, the data points obtained from image analysis (circles) are nicely fitted (line) by the equation of a circle, $R_{SEC}^2 = R_t^2 - (Z - Z_c)^2$.

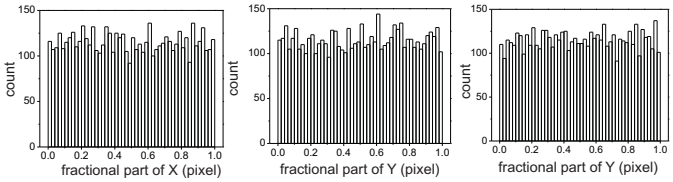

Fig. S3 Distribution of the fractional part of the particle coordinates X_c, Y_c and Z_c found using the image analysis routine in an image volume 99.94 × 99.94 × 66 μm^3. The histograms are almost flat in all three graphs which is a clear indication that particles are located with sub-pixel resolution.